Pfizer Inc.
100 Route 206 North, MS LLA-401
Peapack, NJ 07977
Tel: 908-901-8630

October 13, 2017

Via e-mail and U.S. Postal Service

David N. Cuevas-Miranda, Ph.D.
Geologist/Marine Scientist
Senior RCRA Corrective Action Project Manager
US EPA-Region 2
Caribbean Environmental Protection Division
City View Plaza II, Suite 7000
Guaynabo, Puerto Rico 00968

RE: Pfizer Pharmaceuticals, LLC, Carolina Puerto Rico Site - 65th Infantry Avenue, Km. 9.7
Risk-Based Closure Criteria for Remedial Activities

Dear Mr. Cuevas:

On behalf of Pfizer Pharmaceuticals, LLC (PPLLC), please find attached a Technical Memorandum prepared by Golder Associates Inc. that presents risk-based closure criteria (RBCC) for the former Wyeth Carolina, Puerto Rico facility. The RBCC are based on the intended site use (i.e. industrial/commercial) and groundwater use restrictions that would accompany site restrictive covenants/deed restrictions.

It would be good to discuss the attached Technical Memorandum, when convenient for you; however, I understand that it may be a while following the major devastation from the hurricane - as our thoughts and prayers are with you.

Sincerely,

William G. Gierke, P.G., Senior Manager
Pfizer Inc.

TECHNICAL MEMORANDUM

Date: October 13, 2017 **Project No.:** 103-82746B

To: William Gierke – Pfizer Inc.

From: Gregory Garvey

cc: Jeff Paul, Kirk Blevins

RE: **DEVELOPMENT OF SITE-SPECIFIC RISK-BASED CLOSURE CRITERIA – FORMER WYETH FACILITY IN CAROLINA, PUERTO RICO**

Golder Associates Inc. (Golder) has prepared this Technical Memorandum, on behalf of Pfizer Inc. (Pfizer), to summarize the risk-based closure criteria (RBCC) for the former Wyeth facility in Carolina, Puerto Rico (site). The criteria presented in this memorandum are based on potential on-site exposures to constituents of concern under current conditions via the potential vapor intrusion pathway. This memorandum summarizes the approach for calculating the criteria and presents the criteria for risk-based closure for the site.

1.0 INTRODUCTION

Analytical results from assessment activities conducted from September 2010 through December 2013, reported that chlorinated volatile organic compounds (CVOCs) were detected in soil and groundwater at the site. A Remedial Action Plan (RAP) was submitted to the United States Environmental Protection Agency (USEPA) in July 2014. Phased implementation of the RAP commenced in July 2014 with full-scale implementation beginning in the fall of 2015. The selected remedial option included injection of amendment to accelerate biodegradation of the CVOCs with subsequent groundwater monitoring.

Prior to implementing any remedial activities, Golder completed a screening level human health risk assessment (HHRA) in 2012. Site conditions have since changed, as constituent concentrations in soil and groundwater are significantly reduced and multiple buildings have been demolished. Therefore, the conclusions of the HHRA may no longer be applicable to the site. As such, Pfizer has requested that Golder evaluate current conditions at the site to establish RBCC that would be protective of human health.

Golder used a multi-step approach to establish the RBCC for the site. This process included evaluating current analytical data, selecting constituents of potential concern (COPCs), and analysis with predictive modeling. The following details the specifics of this process and establishes RBCC for the site.

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2.0 DATA EVALUATION

Golder reviewed the groundwater analytical results from 29 shallow monitoring wells and 36 injection wells at the site. The shallow monitoring wells and injection wells are listed in Attachment A-1 and presented on Figure 1.

For soil, Golder reviewed the soil analytical results from 32 soil borings. The soil borings are listed in Attachment A-2 and locations provided in Figure 2. This review was to determine the usability of the data in selecting COPCs and evaluating/quantifying risk.

2.1 Data Summary

The constituents included in this evaluation were selected based on identified soil and groundwater impacts at the site. For groundwater, the following constituents were identified: ethane, ethene, methane, 1,1-dichloroethene, cis-1,2-dichloroethene, total 1,2-dichloroethene, tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride. For soil, the following constituents were identified: chloroform, PCE, TCE, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride. For each constituent, the relevant statistical information (frequency of detection, range of reported concentrations, and range of detection limits) was compiled for review and is presented in Tables 1 and 2 for groundwater and soil, respectively. Specific assumptions used in the data analysis are as follows:

- For groundwater, only analytical results of samples collected from shallow monitoring wells were included.
- Only data deemed usable based on the data validation process were included.

2.2 Selection of Constituents of Potential Concern For Human Health Risk Assessment

2.2.1 Groundwater

The USEPA vapor intrusion screening levels (VISLs) (USEPA 2016) for commercial/industrial workers were used as the primary source for human health risk-based screening levels, based on a target cancer risk of 1×10^{-6}, a target hazard quotient (HQ) of 0.1, and a default groundwater to indoor air attenuation factor of 0.001. Constituents whose maximum concentration in groundwater was reported above either of their carcinogenic or non-carcinogenic VISL were considered a COPC for which a constituent-specific RBCC would be derived.

For groundwater in the vicinity of two monitoring wells on the western portion of the property, MW-04S and MW-05S, in accordance with USEPA's *OSWER Technical Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air.* the VISLs are not applicable, as the groundwater at these locations is less than 5 feet below ground surface (ft bgs) (USEPA 2015). Additionally, groundwater sampling from these monitoring wells has reported very low CVOC concentrations and the groundwater in this area is not currently beneath any occupied structures (i.e., it is beneath the facility parking lot).

The results of this comparison identified three constituents (PCE, TCE, and vinyl chloride) as COPCs in groundwater (Table 1). One constituent, 1,1-dichloroethene, was not identified as a COPC based on a maximum detection concentration below its VISL. For the remaining constituents (cis-1,2-dichlroroethene, total 1,2-dichloroethene, ethane, ethene, and methane) numerical VISLs were not available due to a lack of inhalation toxicity factors. Therefore, they were not retained as COPCs and were evaluated qualitatively in the uncertainty analysis (Section 6.0).

2.2.2 Soil

Recent USEPA guidance documents on evaluating the vapor intrusion pathway (USEPA 2014; 2015) do not include an approach for evaluating soil concentrations of VOCs, particularly deeper soils. VISLs for soil are not recommended based on the high degree of uncertainty with the partitioning of VOCs from soil to soil vapor (USEPA 2015). Although soil vapor sampling may be recommended when soil concentrations are high, the area of soil impacts are located within the vicinity of high groundwater impacts and soil vapor impacts from soil would not be distinguishable from groundwater. In addition, the CVOCs detected in soils at the site are at a significant depth (>20 ft bgs), which would limit any potential vapor intrusion risks. The impacted soils are also within the depth and location of the current injection areas and are likely to decrease as remedial activities continue at the site.

For the purposes of developing RBCC, any CVOCs in soils will be addressed qualitatively and as part of the uncertainty analysis (Section 6.0).

3.0 CALCULATION OF RISK-BASED CLOSURE CRITERIA

Golder modified the Johnson & Ettinger (J&E) model for vapor intrusion (USEPA 2004) to reflect site-specific conditions (i.e., depth to groundwater) and revised default values for groundwater temperature and soil properties.

The 30 shallow monitoring wells were separated based on geographic distribution (see Figure 1) in order to evaluate potential RBCCs based on specific areas of the site, rather than on a single well location. This allowed for a more specific evaluation of potential future building conditions. The depth to groundwater for each well grouping (Attachments B-1 and B-2) was calculated by averaging the average depth to groundwater for each well within a group. The well location or area groupings are as follows:

- Group 1 – MW-04S, MW-05S, MW-06S, and MW-09S;
- Group 2 – MW-07S, MW-15S, MW-21S, MW-22S, and MW-31S;
- Group 3 – MW-02S, MW-11S, MW-16S, MW-23S, MW-24S, and MW-28S;
- Group 4 – MW-13S, MW-17S, MW-18S, MW-19S, and MW-20S;
- Group 5 – MW-08S, MW-10S, and MW-14S;
- Group 6 – MW-03S and MW-12S;
- Group 7 – MW-01S; and
- Group 8 – MW-25S (now INJ-36), MW-26S, MW-27S, and MW-29S

The lithology from the ground surface through the shallow saturated zone is primarily comprised of saprolite material. Saprolite is not listed as a soil type in the J&E model. Of the soil types listed in the J&E model, the characteristics of sandy clay best corresponded with the saprolite characteristics observed at the site and its default values were used in the model. The average default groundwater temperature for south Florida of 25 degrees Celsius (C) (USEPA, 2004) was used in the model, which is similar/close to what was observed at the site (27 degrees C). Chemical-specific factors utilized within the J&E model for the selected COPCs were updated to be consistent with the values present in the most recent USEPA regional screening level (RSL) tables (USEPA 2017). The J&E model worksheets for groundwater to indoor air attenuation are presented in Attachment C. The groundwater to indoor air attenuation factors for the COPCs, calculated by the J&E model, are summarized in Table 3.

4.0 CALCULATION AND SELECTION OF RISK-BASED CLOSURE CRITERIA

The RBCC were calculated on a constituent and monitoring well location grouping-specific basis using site-specific groundwater attenuation factors, adjusted industrial worker RSLs for ambient air (USEPA 2017), and constituent-specific Henry's law constants (USEPA 2017). In order to account for cumulative risk in the calculation of RBCC, the constituent-specific industrial worker RSLs for ambient air were adjusted to reflect a target cancer risk of 2.0×10^{-5} and target hazard quotient of 1.0, which is appropriate as PCE, TCE, and vinyl chloride have differing target organs (see Table 3). The target risk level of 2.0×10^{-5} and target hazard quotient of 1.0 were selected based on best professional judgment in order to demonstrate that if the concentrations of COPCs are at or below the proposed RBCCs, then the resulting risk would be within the acceptable USEPA target carcinogenic risk range of 1.0×10^{-6} to 1.0×10^{-4} and target organ-specific hazard quotient of 1.0.

The lower of the carcinogenic and non-carcinogenic, adjusted ambient air RSLs, was selected as the target indoor air concentration. Groundwater protective concentrations, defined as the maximum groundwater concentration that would be protective of indoor air, were then calculated using the methodology described in the USEPA vapor intrusion screening level (VISL) users guide (USEPA 2014) using the following equation:

$$C_{gw} = \frac{C_{target,ia}}{HLC \times AF_{gw} \times \frac{1000\ L}{m^3}}$$

Where:

- C_{gw} = maximum target groundwater concentration (microgram per liter; µg/l)
- $C_{target,ia}$ = target indoor air concentration (microgram per cubic meter; µg/m^3)
- AF_{gw} = attenuation factor (unit less)
- HLC = dimensionless Henry's Law constant (unit less)

Golder calculated the RBCC for each COPC, within each of the eight monitoring well location groups, results of which are in Table 3. From the eight groups, the lowest, i.e., most conservative, value derived for each COPC was selected as the final site-wide RBCC. The site-wide RBCC values for each COPC are as follows:

COPC	Calculated RBC (µg/L)
Tetrachloroethene (PCE)	23,585
Trichloroethene (TCE)	2,482
Vinyl Chloride	3,104

5.0 RISK EVALUATION/MANAGEMENT

PCE and vinyl chloride concentrations in groundwater at the site have not exceeded their proposed RBCC concentrations since assessment and monitoring activities began in 2011. The highest concentrations of PCE and vinyl chloride detected at the site have been 133 µg/l and 2,570 µg/l, respectively.

Prior to full-scale remedial implementation (fall 2015), TCE concentrations in groundwater were above the proposed RBCC in the following wells: MW-13S, MW-16S, MW-17S, and MW-18S. Since full-scale implementation, TCE concentrations are and have remained below the proposed RBCC in groundwater from these wells. Additional monitoring wells and injection wells have been installed and sampled since remedial implementation. Groundwater analytical results have indicated TCE concentrations above the proposed RBCC in two locations of the site. Specifically, groundwater from injection wells INJ-36 (formerly monitoring well MW-25S) and INJ-38 had initial concentrations of TCE of 4,770 µg/l and 3,440 µg/l, respectively. However, subsequent monitoring of groundwater from injection well INJ-36, after remedial implementation, has indicated a substantial decrease in TCE concentrations to 147 µg/l. The injection well INJ-38 location will also be subject to remedial activities (amendment injections) and concentrations of TCE are expected to decrease as observed across the site.

6.0 UNCERTAINTY ANALYSIS

As is typical in risk evaluations, the use of generic screening criteria and development of risk-based criteria have associated uncertainties. These uncertainties are addressed by making protective assumptions such that risks are more likely to be overestimated than underestimated. The primary areas of uncertainty and associated limitations are qualitatively discussed in this section.

6.1 Screening Level Selection

The selection of VISLs used to select COPCs relies upon the use of toxicity values developed by the USEPA to evaluate potential chronic toxicity of COPCs. While these values may be estimated from human experimental or epidemiological data, they are more likely to be based on animal data generated from a variety of toxicological studies, which may both over- and underestimate the potential for toxicity.

Inhalation toxicity values are not available for some of the constituents (i.e., 1,1-dichloroethene, cis-1,2-dichloroethene, total 1,2-dichloroethene, ethane, ethene, and methane) reported as detected at the site. As such, the potential for risk from the inhalation of these constituents cannot be quantitatively assessed. However, while there is a degree of risk from exposure to all organic chemicals, toxic effects from exposure to these compounds is thought to be less than those with available toxicity criteria. The potential for risk associated with these constituents is deemed minimal at the site.

There is no available screening criteria for soil to indoor air VISLs, primarily due to the high degree of uncertainty with estimating partitioning of VOCs from soil into soil vapor. While excluding soil from this evaluation may underestimate risks, the VOCs in soil at the site are only detected at depths greater than 20 ft bgs and, therefore, are unlikely to be a significant source of impacts to indoor air. In addition, the CVOCs in soil are not currently beneath any occupied structures at the site, are within the current remedial implementation area, and will likely decrease as remedial activities continue at the site.

6.2 Johnson & Ettinger Model

There are various sources of uncertainty in the evaluation of vapor intrusion risks using the J&E Model. As potential future use of the property as either commercial/industrial development or residential development is unknown at this time, the potential building properties, dimensions, and foundation structures are also not known. These unknowns have the potential to overestimate and underestimate potential levels of attenuation, which in turn could result in either decreased or elevated RBCC. In addition, the use of conservative default soil properties for parameters for which site-specific values are not available has the potential to overestimate risk.

7.0 SUMMARY

Based on the results of this evaluation, the COPCs at the site are PCE, TCE, and vinyl chloride in groundwater. Maximum concentrations of PCE and vinyl chloride detected in groundwater have not exceeded their calculated RBCC. Since full-scale implementation of the remedial activities, TCE concentrations have not exceeded its calculated RBCC in groundwater, with the exception of groundwater from INJ-38, which was recently installed and sampled (June 2017). Current groundwater concentrations of COPCs indicate that there is a potential for vapor intrusion at the site in the vicinity of INJ-38; however, this area is scheduled for remedial treatment and is not currently within 100 ft of any occupied structure. Therefore, groundwater in the vicinity of injection well INJ-38 does not present a current risk while remedial activities are being conducted and will likely present even less of a risk upon completion of remedial activities.

8.0 REFERENCES

USEPA, 2004. Johnson & Ettinger Model for Subsurface Vapor Intrusion into Buildings. Last updated June 2004. Located at https://www.epa.gov/vaporintrusion/epa-spreadsheet-modeling-subsurface-vapor-intrusion

USEPA, 2014. Vapor Intrusion Screening Levels Users Guide – May 2014. Available at: https://www.epa.gov/sites/production/files/2015-09/documents/visl-usersguide_1.pdf

USEPA. 2015. OSWER Technical Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air. Office of Solid Waste and Emergency Response. Pub No. 9200.2-154. June.

USEPA, 2016. Vapor Intrusion Screening Levels – June 2016. Available at: https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-levels-visls

USEPA, 2017. Regional Screening Level Tables – June 2017. Available at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm

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TABLE 1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONSTITUENTS OF POTENTIAL CONCERN IN GROUNDWATER

Pfizer, Inc.
Carolina, Puerto Rico

Exposure Point	CAS Number	Constituent	Minimum Concentration (Qualifier) (1)		Maximum Concentration (Qualifier) (1)		Units	Location of Maximum Concentration	Detection Frequency	Range of Method Detection Limits		Concentration Used for Screening (2)	Background Value (3)	Vapor Intrusion Screening Levels Toxicity Value (µg/L) (N/C) (4)		Potential ARAR Value (µg/l)	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Vapor Intrusion to Indoor Air - Shallow GW	75-35-4	Dichloroethylene, 1,1-	0.50	--	68	--	ug/l	MW-17S	134/181	0.50	50	68	NA	82	n	NA	NA	N	BSL
	156-59-2	Dichloroethylene, 1,2-cis-	0.50	--	10,200	--	ug/l	MW-17S	171/181	0.50	12	10,200	NA	NA	--	NA	NA	N	NSL
	156-60-5	Dichloroethylene, 1,2 (total)	0.50	--	10,300	--	ug/l	MW-17S	173/181	0.50	0.50	10,300	NA	NA	--	NA	NA	N	NSL
	74-84-0	Ethane	0.01	--	86	--	ug/l	MW-16S	44/53	0.018	4.9	86	NA	NA	--	NA	NA	N	NSL
	74-85-1	Ethene	0.022	I	110	--	ug/l	INJ-7	51/53	0.20	0.68	110	NA	NA	--	NA	NA	N	NSL
	74-82-8	Methane	0.12	I	7,410	--	ug/l	MW-16S	52/53	0.20	0.20	7,410	NA	NA	--	NA	NA	N	NSL
	127-18-4	**Tetrachloroethylene**	**0.50**	**--**	**133**	**--**	**ug/l**	**MW-03S**	**67/181**	**0.50**	**50**	**133**	**NA**	**24**	**n**	**NA**	**NA**	**Y**	**ASL**
	79-01-6	**Trichloroethylene**	**0.56**	I	**5,930**	**--**	**ug/l**	**MW-17S**	**164/181**	**0.50**	**12**	**5,930**	**NA**	**2.2**	**n**	**NA**	**NA**	**Y**	**ASL**
	75-01-4	**Vinyl Chloride**	**1.0**	**--**	**2,570**	**--**	**ug/l**	**MW-16S**	**152/181**	**0.50**	**12**	**2,570**	**NA**	**2.5**	**c**	**NA**	**NA**	**Y**	**ASL**

Footnote Instructions:

(1) I = The reported value is between the laboratory MDL and the laboratory practical quantitation limit (PQL).

(2) Maximum detected concentration used for screening.

(3) No background value available.

(4) All compounds are screened against the Environmental Protection Agency's (EPA) Vapor Instrusion Screening Levels dated June 2016 (cancer benchmark value = 1E-06; HQ =0.1).

(5) Rationale Codes — Selection Reason: Above Screening Level (ASL); Deletion Reason: Below Screening Level (BSL); No Screening Level (NSL)

Definitions:

NA = Not Applicable

COPC = Constituent of Potential Concern

ARAR = Applicable or Relevant and Appropriate Requirement

n = Noncarcinogen

c = Carcinogen

Y = Yes

N = No

µg/L = micrograms per liter

TABLE 2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONSTITUENTS OF POTENTIAL CONCERN IN SOIL

Pfizer, Inc.
Carolina, Puerto Rico

Exposure Point	CAS Number	Constituent	Minimum Concentration (Qualifier) (1)		Maximum Concentration (Qualifier) (1)		Units	Location of Maximum Concentration	Detection Frequency	Range of Method Detection Limits		Concentration Used for Screening (2)	Background Value (3)	Vapor Intrusion Screening Levels Toxicity Value		Potential ARAR Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
Vapor Intrusion to Indoor Air - Soil	156-59-2	Dichloroethylene, 1,2-cis-	0.0034	I	0.56	--	mg/kg	TB-43	12/40	0.0013	0.012	0.56	NA	NA	--	NA	NA	N	NSL
	156-60-5	Dichloroethylene, 1,2 (trans)	0.0041	I	0.0043	I	mg/kg	TB-43	2/40	0.0016	0.014	0.0043	NA	NA	--	NA	NA	N	NSL
	67-66-3	Chloroform	0.0035	--	0.0045	I	mg/kg	TB-52	2/18	0.0024	0.0049	0.0045	NA	NA	--	NA	NA	N	NSL
	PRO	Petroleum Range Organics	29	--	935	--	mg/kg	TB-33	2/6	4.9	25	935	NA	NA	--	NA	NA	N	NSL
	127-18-4	Tetrachloroethylene	0.0028	I	0.0053	--	mg/kg	TB-54	2/40	0.0013	0.012	0.0053	NA	NA	--	NA	NA	N	NSL
	79-01-6	Trichloroethylene	0.0032	I	6.3	--	mg/kg	TB-52	13/40	0.0014	0.013	6.3	NA	NA	--	NA	NA	N	NSL
	75-01-4	Vinyl Chloride	0.0035	I	0.045	--	mg/kg	TB-43	6/40	0.0014	0.013	0.045	NA	NA	--	NA	NA	N	NSL

Footnote Instructions:

(1) I = The reported value is between the laboratory MDL and the laboratory practical quantitation limit (PQL).

(2) Maximum detected concentration used for screening.

(3) No background value available.

(4) Rationale Codes No Screening Level (NSL)

Definitions:

NA = Not Applicable

COPC = Constituent of Potential Concern

ARAR = Applicable or Relevant and Appropriate Requirement

N = No

mg/kg = milligrams per kilogram

TABLE 3
RISK-BASED CLOSURE CONCENTRATIONS FOR GROUNDWATER

Pfizer, Inc.
Carolina, Puerto Rico

CAS	Constituent of Potential Concern[1]	Units	Maximum Detected Concentration[2]		Attenuation Factor (unitless)[4]	Henry's Law Constant (unitless)[3]	Indoor Air RSL[5]				Groundwater Risk-Based Closure Criteria	
							Carcinogenic Value (ug/m^3)	Non-Carcinogenic Value (ug/m^3)	Target Organ[6]	Selected Value (ug/m^3)[7]	Value	Units
Group 1												
79-01-6	Trichloroethylene	ug/l	26	--	8.9E-06	0.40	60	8.8	Immunological/Developmental/Cardiac	8.8	2,482	ug/l
Group 2												
127-18-4	Tetrachloroethylene	ug/l	3.0	--	1.0E-05	0.72	940	180	Neurological	180	24,038	ug/l
79-01-6	Trichloroethylene	ug/l	1,970	--	8.6E-06	0.40	60	8.8	Immunological/Developmental/Cardiac	8.8	2,570	ug/l
75-01-4	Vinyl Chloride	ug/l	1,060	--	1.6E-05	1.1	56	440	Liver	56	3,162	ug/l
Group 3												
127-18-4	Tetrachloroethylene	ug/l	3.9	--	1.0E-05	0.72	940	180	Neurological	180	24,272	ug/l
79-01-6	**Trichloroethylene**	**ug/l**	**4,000**	**--**	**8.5E-06**	**0.40**	**60**	**8.8**	**Immunological/Developmental/Cardiac**	**8.8**	**2,588**	**ug/l**
75-01-4	Vinyl Chloride	ug/l	2,570	--	1.6E-05	1.1	56	440	Liver	56	3,182	ug/l
Group 4												
127-18-4	Tetrachloroethylene	ug/l	3.5	--	1.1E-05	0.72	940	180	Neurological	180	23,585	ug/l
79-01-6	**Trichloroethylene**	**ug/l**	**5,930**	**--**	**8.5E-06**	**0.40**	**60**	**8.8**	**Immunological/Developmental/Cardiac**	**8.8**	**2,597**	**ug/l**
75-01-4	Vinyl Chloride	ug/l	1,830	--	1.6E-05	1.1	56	440	Liver	56	3,202	ug/l
Group 5												
127-18-4	Tetrachloroethylene	ug/l	31	--	1.0E-05	0.72	940	180	Neurological	180	24,038	ug/l
79-01-6	Trichloroethylene	ug/l	12	--	8.6E-06	0.40	60	8.8	Immunological/Developmental/Cardiac	8.8	2,567	ug/l
75-01-4	Vinyl Chloride	ug/l	2.1	--	1.6E-05	1.1	56	440	Liver	56	3,162	ug/l
Group 6												
127-18-4	Tetrachloroethylene	ug/l	133	--	1.1E-05	0.72	940	180	Neurological	180	23,585	ug/l
79-01-6	Trichloroethylene	ug/l	109	--	8.7E-06	0.40	60	8.8	Immunological/Developmental/Cardiac	8.8	2,535	ug/l
75-01-4	Vinyl Chloride	ug/l	6.3	--	1.6E-05	1.1	56	440	Liver	56	3,104	ug/l
Group 7												
127-18-4	Tetrachloroethylene	ug/l	0.72	--	1.0E-05	0.72	940	180	Neurological	180	24,272	ug/l
79-01-6	Trichloroethylene	ug/l	3.2	--	8.7E-06	0.40	60	8.8	Immunological/Developmental/Cardiac	8.8	2,535	ug/l
Group 8												
127-18-4	Tetrachloroethylene	ug/l	18	--	1.0E-05	0.72	940	180	Neurological	180	24,038	ug/l
79-01-6	**Trichloroethylene**	**ug/l**	**4,770**	**--**	**8.6E-06**	**0.40**	**60**	**8.8**	**Immunological/Developmental/Cardiac**	**8.8**	**2,570**	**ug/l**
75-01-4	Vinyl Chloride	ug/l	198	--	1.6E-05	1.1	56	440	Liver	56	3,162	ug/l
Site-Wide												
127-18-4	Tetrachloroethylene	ug/l	133	--	1.1E-05	0.72	940	180	Neurological	180	23,585	ug/l
79-01-6	**Trichloroethylene**	**ug/l**	**5,930**	**--**	**8.9E-06**	**0.40**	**60**	**8.8**	**Immunological/Developmental/Cardiac**	**8.8**	**2,482**	**ug/l**
75-01-4	Vinyl Chloride	ug/l	2,570	--	1.6E-05	1.1	56	440	Liver	56	3,104	ug/l

Footnote Instructions:

(1) Constituents on this table exceed their risk-based VISLs.

.(2) Maximum Detected Concentrations represent the maximum concentration detected in the primary samples used in the analysis.

(3) Taken from the USEPA RSL table, dated June 2017.

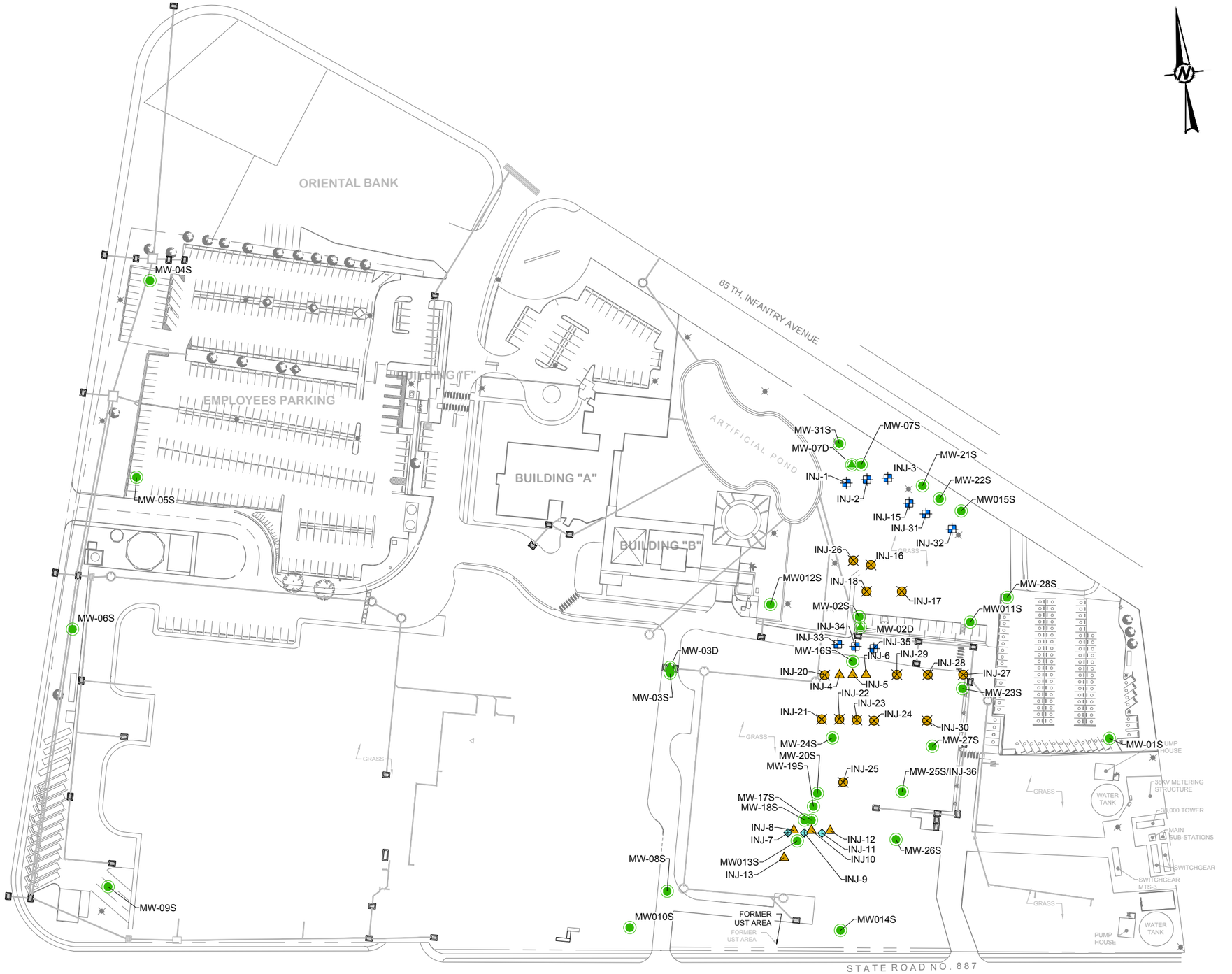
(4) Site-specific attenuation factors calculated using the USEPA Johnson & Ettinger Model, as presented in Appendix A.

(5) Taken from the USEPA RSL tables for industrial worker ambient air, adjusted for a target cancer risk of 2.0E-05 and HQ of 1.0.

(6) Target organs taken from the USEPA IRIS database profile for each COC, which is the source of the toxicity factor used to determine the non-cancer RLS value.

(7) The lower of the carcinogenic and non-carcinogenic adjusted RSL values.

FIGURES



LEGEND

- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- BEDROCK INJECTION TREATMENT WELL (SCREEN INTERVAL ~20 TO 40 FEET-BGS)
- OVERBURDEN INJECTION TREATMENT WELL (SCREEN INTERVAL ~40 TO 50 FEET BGS)
- OVERBURDEN INJECTION TREATMENT WELL (SCREEN INTERVAL ~50 TO 60 FEET BGS)
- INJECTION TREATMENT WELL LOCATION (OVERBURDEN)

NOTE(S)

1.) ALL SITE BUILDINGS WITH THE EXCEPTION OF BUILDINGS A, B, AND F WERE DEMOLISHED IN 2013.

REFERENCE(S)

1.) BASEMAP TAKEN FROM WYETH - CAROLINA, FILE NAME "C-SITE-004.dwg", TITLED "STORM WATER PLAN", DATED 08/18/2008.

CLIENT
Pfizer

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-10-13
DESIGNED	KAB
PREPARED	BCL
REVIEWED	GJG
APPROVED	KAB

PROJECT
Pfizer-CAROLINA
SITE-SPECIFIC RISK-BASED CLOSURE CRITERIA

TITLE
GROUNDWATER DATA LOCATIONS

PROJECT NO.	Control No.	REV.	FIGURE
103-82746	10382746-ZM004		1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

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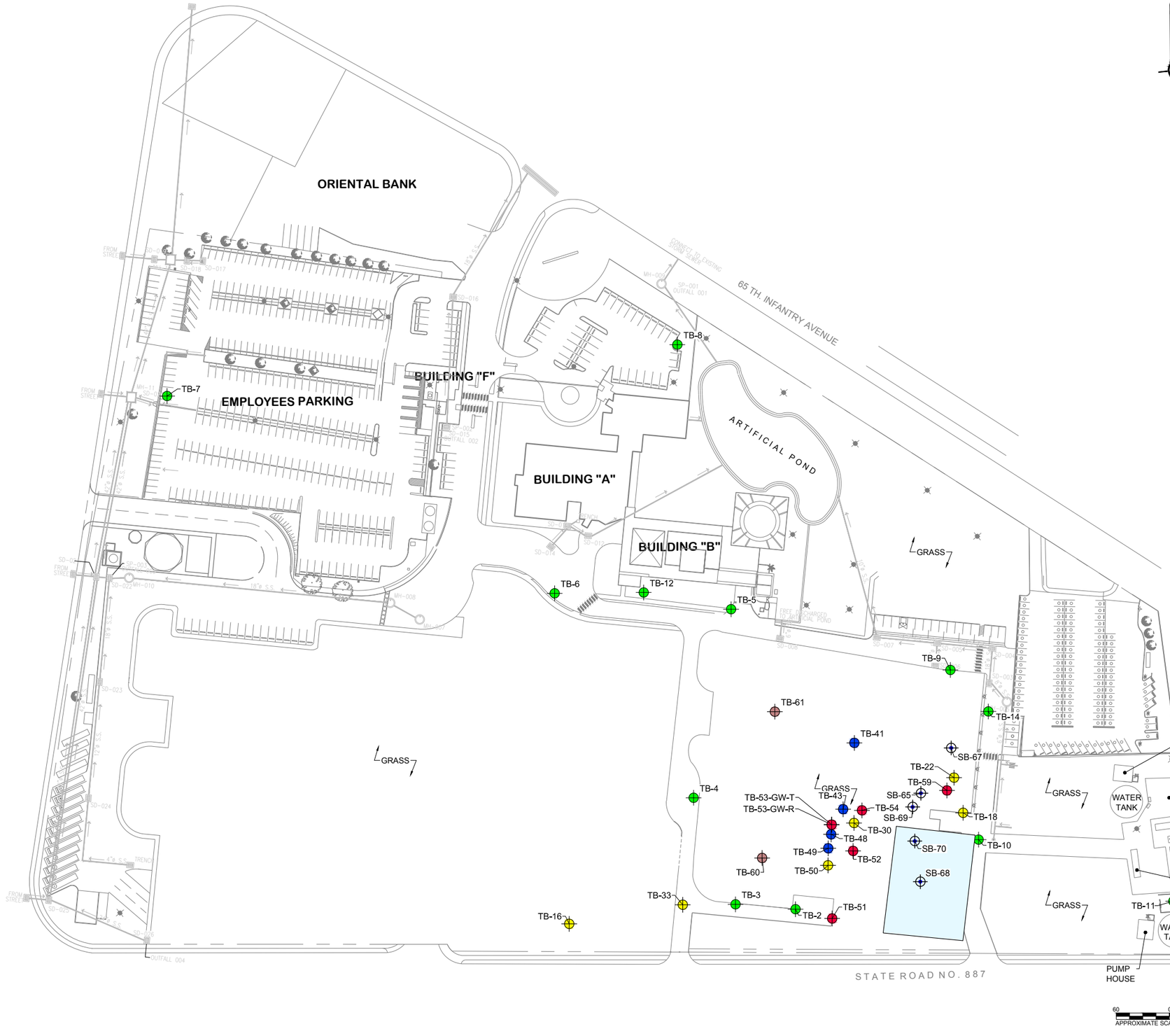
Path: \\jacksonville\drafting\File\2010\103-82746 Pfizer-Carolina Phase II\ZM - RBCC Report\Active Drawings\ | File Name: 10382746-ZM004.dwg



LEGEND

- TEMPORARY BORING LOCATION (SEPT. 2010 & JAN. 2011)
- TEMPORARY BORING LOCATION ADVANCED < 16.5 FT. (JULY 2013)
- TEMPORARY BORING LOCATION ADVANCED ≥ 16.5 FT. (JULY 2013)
- TEMPORARY BORING LOCATION ADVANCED ≥ 16.5 FT. (OCT-NOV. 2013)
- TEMPORARY BORING LOCATION ADVANCED ≥ 16.5 FT. (DEC. 2013)
- SOIL BORING LOCATION
- OCTOBER 2013 EXCAVATION AREA

NOTE(S)

1.) ALL SITE BUILDINGS, WITH THE EXCEPTION OF BUILDINGS A, B, AND F, WERE DEMOLISHED IN 2013.

2.) ONLY SOIL BORING LOCATIONS WITH DATA WERE INCLUDED IN THIS FIGURE.

REFERENCE(S)

1.) BASE MAP TAKEN FROM CADD FILE ORIGINALLY PREPARED BY WYETH - CAROLINA TITLED "STORM WATER PLAN", FILE NAME "C-SITE-004.dwg", REVISION 2, DATED 05/11/2010. BASE MAP MODIFIED BY GOLDER ASSOCIATES ON 02/06/2014 TO REFLECT EXISTING SITE CONDITIONS AS PER AERIAL PHOTOGRAPHS PROVIDED BY PFIZER INC., DATED 11/01/2013. ACTUAL SITE CONDITIONS MAY VARY.

CLIENT
Pfizer

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-10-13
DESIGNED	KAB
PREPARED	BCL
REVIEWED	GJG
APPROVED	KAB

PROJECT
Pfizer-CAROLINA
SITE-SPECIFIC RISK-BASED CLOSURE CRITERIA

TITLE
SOIL BORING DATA LOCATIONS

PROJECT NO.	Control No.	REV.	FIGURE
103-82746	10382746-ZM004A		2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

Path: \\jacksonville\drafting\File\2010\103-82746 Pfizer-Carolina Phase II\ZM - RBCC Report\Active Drawings\ | File Name: 10382746-ZM004A.dwg

ATTACHMENT A
SAMPLING DATA

Sample			Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	1,2-Dichloroethene (Total)*	Vinyl Chloride	Methane	Ethane	Ethene
Location	Group	Date									
MW-01S	7	02/02/2011	0.5	2.8	1.2	0.50 U	0.50 U	0.50 U	NM	NM	NM
		10/17/2011	0.64 I	3.2	0.80 I	0.50 U	0.50 U	0.50 U	NM	NM	NM
		09/12/2012	0.72 I	2.3	0.50 U	0.50 U	0.50 U	0.50 U	0.12 I	0.20 U	0.037 I
MW-02S	3	02/02/2011	1.4	1,630	9.9	1,490	1,500	303	NM	NM	NM
		10/18/2011	1.6	1,830	7.9	1,780	1,790	253	NM	NM	NM
		09/11/2012	1.4	1,090	7.7	1,200	1,200	222	410	5.3	4.3
		04/17/2013	1.5	776	9.4	1,280	1,290	130	NM	NM	NM
		12/04/2013	1.3	1,330	7.3	1,390	1,400	329	600	0.87	1.7
		02/03/2015	1.6	1,550	8.3	1,710	1,730	248	NM	NM	NM
		03/16/2015	1.3	1,230	7.4	1,370	1,380	186	200	5.0	2.8
		04/21/2015	1.6	1,260	9.3	1,440	1,450	157	150	3.9	2.3
		08/07/2015	1.4	1,560	8.3	1,640	1,660	257	NM	NM	NM
		01/17/2016	0.50 U	278	1.9	381	393	19.3	NM	NM	NM
		04/18/2016	0.56 I	661	5.0	1,080	1,110	354	NM	NM	NM
		07/26/2016	50.0 U	1,350	50.0 U	1,420	1,550	318	NM	NM	NM
		12/21/2016	0.50 U	353	4.1	621	770	193	NM	NM	NM
		06/20/2017	0.50 U	106	1.9	494	692	185	NM	NM	NM
MW-03S	6	02/02/2011	85.4	20	6.9	32.2	32.6	4.3	NM	NM	NM
		10/18/2011	133	34.3	7.5	46.9	47.3	4.1	NM	NM	NM
		09/12/2012	110	30.0	7.5	46.6	46.8	4.2	1.0	0.19 I	0.14 I
		04/17/2013	68	37.9	9.8	54.4	54.9	3.5	NM	NM	NM
		12/04/2013	132	36.8	7.2	45.9	46.2	6.3	0.46	0.16 I	0.045 I
MW-04S	1	02/02/2011	0.50 U	0.50 U	0.5	0.50 U	0.50 U	0.50 U	NM	NM	NM
		10/17/2011	0.50 U	0.50 U	0.58 I	0.50 U	0.50 U	0.50 U	NM	NM	NM
		09/12/2012	0.50 U	0.50 U	0.54 I	0.50 U	0.50 U	0.50 U	9.1	0.010 I	0.027 I
MW-05S	1	02/02/2011	0.50 U	1.8	1.7	0.5	0.5	0.50 U	NM	NM	NM
		10/17/2011	0.50 U	2.4	0.74 I	0.59 I	0.59 I	0.50 U	NM	NM	NM
		09/12/2012	0.50 U	2.1	1.1	0.74 I	0.74 I	0.50 U	2.6	0.070 I	0.064 I
		12/05/2013	0.50 U	3.7	1.2	0.79 I	0.79 I	0.50 U	1.9	0.018 U	0.022 I
MW-06S	1	02/02/2011	0.50 U	19	7.4	4.1	4.1	0.50 U	NM	NM	NM
		10/18/2011	0.50 U	17.9	5.9	4.4	4.4	0.50 U	NM	NM	NM
		09/11/2012	0.50 U	17.8	5.0	3.5	3.5	0.50 U	3.0	0.017 I	0.052 I
		12/05/2013	0.50 U	26.0	6.3	4.4	4.5	0.50 U	3.3	0.018 U	0.030 I
MW-07S	2	10/17/2011	2.2	538	2.1	324	327	41.6	NM	NM	NM
		09/11/2012	2.1	467	2.7	309	312	77.2	0.20 U	0.20 U	0.20 U
		04/17/2013	3.0	375	4.1	403	408	70.8	NM	NM	NM
		12/03/2013	1.9	703	3.5	494	497	99.2	120	2.0	0.63
		02/03/2015	1.7	666	2.4	509	519	68.7	NM	NM	NM
		03/17/2015	1.5	645	3.6	547	552	92.5	72	1.8	0.62
		04/22/2015	2.0	744	4.5	636	643	100	75	2.2	0.69
		07/17/2015	NM	NM	NM	NM	NM	NM	NM	NM	NM
		07/21/2015	NM	NM	NM	NM	NM	NM	NM	NM	NM
		07/28/2015	NM	NM	NM	NM	NM	NM	NM	NM	NM
		07/31/2015	1.2 U	68.9	6.2	1,536	1,546	1.2 U	NM	NM	NM
		08/11/2015	2.5 U	315	4.7 I	1,210	1,220	116	NM	NM	NM
		01/17/2016	0.50 U	3.1	0.50 U	11.4	25.1	1,060	NM	NM	NM
		04/18/2016	0.50 U	23.6	0.76 I	77.8	84.8	186	NM	NM	NM
		07/26/2016	2.5 U	14.7	2.5 U	248	300	223	5,370	3.8 I	92.7
		12/21/2016	0.50 U	0.50 U	1.5	285	358	193	NM	NM	NM
		06/20/2017	0.50 U	0.66 I	0.50 U	23	34	23	1,330	4.9 U	6.9 I

Sample			Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	1,2-Dichloroethene (Total)*	Vinyl Chloride	Methane	Ethane	Ethene
Location	Group	Date									
MW-08S	5	10/17/2011	25.9	12.1	2.3	10	10	2.1	NM	NM	NM
		09/12/2012	31.4	11.3	2.4	10.7	10.7	0.50 U	0.35	0.059 I	0.086 I
		12/05/2013	10.9	4.3	0.85 I	2.9	2.9	0.50 U	0.48	0.018 U	0.035 I
MW-09S	1	10/17/2011	0.50 U	14.3	9.2	0.99 I	0.99 I	0.50 U	NM	NM	NM
		09/11/2012	0.50 U	13.7	8.5	0.76 I	0.76 I	0.50 U	0.68	0.20 U	0.050 I
		12/04/2013	0.50 U	13.7	8.1	0.85 I	0.85 I	0.50 U	1.3	0.018 U	0.026 I
MW-10S	5	12/03/2013	29.7	11.6	2.8	10.8	10.8	1.3	1.0	0.37	0.032 I
MW-11S	3	12/03/2013	0.50 U	62.6	0.50 U	8.1	8.8	1.3	8.6	2.0	0.84
MW-12S	6	12/02/2013	28.3	109	2.9	44	44.6	1.6	4.2	0.49	0.53
MW-13S	4	12/02/2013	3.5	3,510	12.1	2,610	2,640	429	550	14	13
		12/2/2013[1]	3.2	2,770	13.9	1,890	1,920	324	540	14	14
		01/03/1900	0.85 I	1,310	5.3	1,630	1,640	134	100	2.0	3.2
		04/20/2015	1.3	1,390	14	3,100	3,140	274	210	5.3	10
		04/19/2016	0.50 U	1.2	0.50 U	2.6	18.4	5.1	NM	NM	NM
		07/25/2016	0.50 U	89.9	6.2	2,040	2,080	553	NM	NM	NM
		12/21/2016	0.50 U	31.1	0.50 U	158	347	74	NM	NM	NM
		06/20/2017	0.50 U	161	2.5	256	606	85.1	NM	NM	NM
MW-14S	5	12/04/2013	0.50 U	1.2	0.50 U	0.50 U	0.50 U	0.50 U	12	5.2	0.13 I
MW-15S	2	12/02/2013	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	52	11	2.9
MW-16S	3	02/03/2015	3.9	4,000	20.3	4,210	4,300	547	1,000	24	14
		03/16/2015	3.5	2,370	16.3	3,180	3,210	397	800	13	8.4
		04/21/2015	3.4	2,630	20	2,980	3,010	383	740	15	8.3
		08/07/2015	2.8	3,560	18	3,940	4,100	709	NM	NM	NM
		12/04/2015	0.50 U	144	0.50 U	969	1,000	2,570	NM	NM	NM
		01/17/2016	0.50 U	290	3.2	737	791	1,020	NM	NM	NM
		07/26/2016	0.50 U	58.7	0.57 I	159	307	117	7,410	31.6	62.6
		12/21/2016	0.50 U	21.6	0.50 U	194	378	156	NM	NM	NM
		06/20/2017	0.50 U	33.8	1.2	360	645	237	2,260	85.6	63.3
MW-17S	4	02/04/2015	1.4	5,930	62.1	9,380	9,530	658	1,200	41	10
		03/16/2015	0.50 U	826	59.4	10,200	10,300	1,080	540	18	5.8
		04/20/2015	0.73 I	2,020	67.7	9,080	9,220	810	920	38	11
		08/07/2015	0.50 U	0.83 I	0.99 I	4.9	85	1,830	NM	NM	NM
		09/11/2015	6.0 U	6.0 U	6.0 U	409	409	26.0	NM	NM	NM
		12/04/2015	0.50 U	0.80 I	0.50 U	4.5	10.6	18.3	NM	NM	NM
		07/27/2016	0.50 U	25.2	0.50 U	7.5	11.1	16.4	2,150	11.4	5.4 I
		12/21/2016	0.50 U	3.4	0.50 U	19.9	35.2	26.6	NM	NM	NM
		06/21/2017	0.50 U	11.0	1.3	300	482	260	NM	NM	NM
MW-18S	4	02/04/2015	0.68 I	3,190	36.6	5,440	5,530	354	1,200	21	5
		03/16/2015	0.50 U	220	42.6	8,160	8,250	414	960	16	3.9
		04/20/2015	0.50 U	917	45.2	5,340	5,430	449	790	16	5.0
		08/07/2015	0.50 U	0.50 U	0.50 U	2.3	61.9	1,820	NM	NM	NM
		09/11/2015	12.0 U	12.0 U	12.0 U	54.8	86.9	114	NM	NM	NM
		06/20/2017	0.50 U	108	1.8	341	571	773	NM	NM	NM
MW-19S	4	07/07/2015	1.2 U	556	12.8	4,502	4,543	317	NM	NM	NM
		08/07/2015	0.50 U	8.8	0.50 U	166	212	486	NM	NM	NM
		09/11/2015	12.0 U	12.0 U	12.0 U	12.0 U	28.4	12.0 U	NM	NM	NM
		04/19/2016	0.50 U	0.50 U	0.50 U	2.4	5.4	5	NM	NM	NM
		12/21/2016	0.50 U	1.8	0.50 U	12.3	22	11	NM	NM	NM
MW-20S	4	07/07/2015	1.2 U	532	9.00	2,544	2,568	181	NM	NM	NM
		08/07/2015	0.50 U	151	4.4	645	670	426	NM	NM	NM
		09/11/2015	12.0 U	12.0 U	12.0 U	12.0 U	35.6	12.0 U	NM	NM	NM
		01/17/2016	0.50 U	113	1.6	193	244	61.3	NM	NM	NM
		07/27/2016	0.50 U	103	1.8	159	224	68.8	NM	NM	NM
MW-21S	2	07/10/2015	1.2 U	1,649	7.0	3,282	3,292	298	NM	NM	NM
		07/31/2015	1.2 U	1,511	7.0	1,608	1,621	1.2 U	NM	NM	NM
		08/11/2015	2.5 U	1,970	8.2	1,480	1,490	214	NM	NM	NM
		04/18/2016	0.50 U	141	3.9	776	793	816	NM	NM	NM
		07/26/2016	12.5 U	161	12.5 U	1,400	1,460	457	NM	NM	NM
		12/21/2016	0.50 U	119	5.4	858	948	232	NM	NM	NM
		06/20/2017	0.50 U	10.6	0.63 I	159	205	117	884	12.5	4.0 I
MW-22S	2	01/17/2016	0.50 U	5.9	0.50 U	2.8	3.0	1.0	NM	NM	NM

Sample			Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	1,2-Dichloroethene (Total)*	Vinyl Chloride	Methane	Ethane	Ethene
Location	Group	Date									
MW-23S	3	01/17/2016	1.2	246	2.5	35.9	40.2	2.4	NM	NM	NM
		07/27/2016	1.3	263	3.8	42.5	48.8	3.0	NM	NM	NM
MW-24S	3	01/17/2016	0.50 U	153	0.50 U	56.5	57	18.0	NM	NM	NM
		04/20/2016	0.50 U	55.6	0.55 I	102	103	7.6	NM	NM	NM
		07/27/2016	0.50 U	145	0.66 I	53.4	53.9	6.3	NM	NM	NM
		12/21/2016	0.50 U	109	0.50 U	36.3	37.0	5.6	NM	NM	NM
MW-26S	8	06/21/2017	17.7	684	1.3	69.1	74.5	37.9	NM	NM	NM
MW-27S	8	11/18/2016	8.2	897	4.7	105	115	18	NM	NM	NM
MW-28S	3	11/18/2016	0.50 U	35.2	0.50 U	7.1	7.5	0.50 U	NM	NM	NM
MW-29S	8	06/21/2017	0.50 U	26.0	0.50 U	8.7	9.2	2.0	41.2	4.9 U	0.68 U
MW-31S	2	06/20/2017	0.61 I	119	0.50 U	23.2	39.2	19.4	NM	NM	NM
INJ-1	2	08/11/2015	2.5 U	2.5 U	2.5 U	25.5	47.6	543	NM	NM	NM
INJ-2	2	02/03/2015	1.4	1,170	4.2	982	1,020	146	NM	NM	NM
		04/21/2015	1.7	1,250	7.4	1,200	1,210	162	900	4.6	1.6
		07/31/2015	1.2 U	2.8	3.0	931	936	1.2 U	NM	NM	NM
		08/11/2015	2.5 U	2.5 U	4.3 I	1,470	1,480	91.8	NM	NM	NM
INJ-3	2	04/22/2015	1.8	1,750	9.3	1,480	1,490	183	590	5.0	1.6
		08/11/2015	2.5 U	5.2	10.1	3,540	3,560	206	NM	NM	NM
		07/28/2016	0.50 U	11.2	0.50 U	48.0	88.7	160	NM	NM	NM
INJ-4	3	08/11/2015	2.5 U	1,290	6.6	1,540	1,580	159	NM	NM	NM
		07/27/2017	0.50 U	7.5	0.50U	169	218	78	NM	NM	NM
INJ-5	3	02/03/2015	3.1	2,260	13.8	3,000	3,050	373	NM	NM	NM
		04/21/2015	1.7	1,210	14.7	2,650	2,690	304	1,400	12	6.7
		07/26/2017	0.50 U	0.61 I	0.50 U	177	363	172	NM	NM	NM
INJ-6	3	04/21/2015	3.2	2,210	16.9	3,710	3,750	451	650	25	12
		07/27/2017	0.50 U	0.56 I	6.1	1,840	2,340	1,000	NM	NM	NM
INJ-7	4	04/20/2015	0.50 U	29.6	1.5	315	331	119	360	1.5	110
		08/07/2015	0.50 U	0.50 U	0.50 U	2.4	10.6	39.8	NM	NM	NM
		01/17/2016	0.50 U	19.9	0.50 U	27.6	54.1	48.1	NM	NM	NM
INJ-8	4	08/07/2015	0.50 U	0.50 U	0.50 U	10.6	19.6	17.9	NM	NM	NM
INJ-9	4	02/04/2015	0.50 U	1,600	24.4	3,860	3,920	379	NM	NM	NM
		08/07/2015	0.50 U	0.61 I	0.50 U	5.9	34.9	420	NM	NM	NM
INJ-10	4	02/03/2015	0.50 U	2,020	37.0	4,690	4,780	444	NM	NM	NM
		04/20/2015	0.50 U	634	29.7	4,970	5,510	1,090	820	16	5.7
		08/07/2015	0.50 U	0.85 I	0.50 U	14.2	53.3	1,410	NM	NM	NM
INJ-11	4	08/07/2015	0.50 U	1.5	0.50 U	25.2	26.7	4.9	NM	NM	NM
INJ-12	4	04/20/2015	0.50 U	169	15.8	1,250	1,370	236	510	1.1	28
		08/07/2015	0.50 U	0.50 U	0.50 U	7.3	59.6	167	NM	NM	NM
INJ-15	2	07/10/2015	1.2 U	1,225	7.50	1,170	1,180	235	NM	NM	NM
		07/31/2015	1.2 U	595	7.3	2,022	2,030	1.2 U	NM	NM	NM
		08/11/2015	2.5 U	3.2 I	12.5	3,630	3,670	220	NM	NM	NM
		01/17/2016	0.50 U	0.54 I	0.50 U	29.9	33.0	291	NM	NM	NM
INJ-16	3	01/17/2016	2.0	1,810	8.2	1,810	1,830	421	NM	NM	NM
		04/18/2016	0.50 U	35.6	0.50 U	203	229	163	NM	NM	NM
		07/27/2017	0.50 U	6.7	2.2	639	829	193	NM	NM	NM
INJ-17	3	01/17/2016	1.1	786	2.0	184	189	12.4	NM	NM	NM
INJ-18	3	01/17/2016	2.1	1,760	10	2,290	2,310	508	NM	NM	NM
		07/27/2017	0.50 U	19.4	2.6	669	854	138	NM	NM	NM
INJ-20	3	01/17/2016	0.50 U	391	1.5	222	224	17.7	NM	NM	NM
INJ-21	3	01/17/2016	0.50 U	252	1.0	105	106	4.8	NM	NM	NM
INJ-22	3	07/27/2017	0.50 U	35	3.5	754	1,070	209	NM	NM	NM
INJ-23	3	01/17/2016	2.0	1,250	12.2	3,150	3,170	820	NM	NM	NM
INJ-24	3	01/17/2016	5.9	3,870	9.9	1,610	1,630	238	NM	NM	NM
		04/20/2016	0.50 U	0.50 U	0.50 U	12.8	23.3	8.1	NM	NM	NM
		07/27/2016	0.50 U	22.5	0.50 U	49.9	55.1	18.8	NM	NM	NM
		06/20/2017	0.70 I	1,120	5.4	1,240	1,970	328	NM	NM	NM
INJ-25	4	07/27/2017	0.50 U	217	7.6	942	1,190	353	NM	NM	NM
INJ-26	3	01/17/2016	0.67 I	155	1.1	134	135	21.4	NM	NM	NM
INJ-27	3	07/26/2016	0.61 I	237	2.6	33.1	37.2	2.9	NM	NM	NM

Sample			Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	1,2-Dichloroethene (Total)*	Vinyl Chloride	Methane	Ethane	Ethene
Location	Group	Date									
INJ-28	3	07/26/2016	0.50 U	191	0.50 U	21.6	22.4	1.6	NM	NM	NM
INJ-29	3	07/26/2016	0.90 I	1,740	1.4	244	249	8.0	NM	NM	NM
INJ-30	3	07/27/2016	2.4	2,180	11.3	279	301	36	NM	NM	NM
INJ-31	2	11/17/2016	0.50 U	146	0.86 I	49.4	51.3	4.4	NM	NM	NM
INJ-32	2	11/17/2016	0.50 U	2.7	0.50 U	1.4	1.4	0.50 U	NM	NM	NM
INJ-33	3	11/18/2016	0.50 U	928	6.6	1,170	1,260	198	NM	NM	NM
INJ-34	3	11/17/2016	0.50 U	1,180	5.5	1,280	1,360	221	NM	NM	NM
		07/26/2017	0.50 U	44.2	0.89 I	81.9	84.9	10.8	NM	NM	NM
INJ-35	3	11/17/2016	0.53 I	769	3.7	1,170	1,340	263	NM	NM	NM
INJ-36 (MW-25S)	8	11/18/2016	15.5	4,770	3.6	547	567	93.1	NM	NM	NM
		06/20/2017	0.50 U	147	2.8	1,010	1,020	198	NM	NM	NM
INJ-37		11/18/2016	8.2	897	4.7	105	115	18.4	NM	NM	NM
INJ-38		06/20/2017	3.2	3,440	2.8	390	406	22.5	NM	NM	NM
INJ-39		06/21/2017	1.2	1,180	18.3	1,140	1,160	191	505	7.2 I	2.1 I

Notes:
All analytical results reported in micrograms per liter (µg/L).
U - Indicates the compound was analyzed for but not detected at a concentration greater than the shown MDL.
I - The reported value is between the laboratory MDL and the laboratory practical quantitation limit (PQL).
MDL - Method Detection Limit
NM - Not Measured
[1]Duplicate sample
*Total 1,2-Dichloroethene is for the *cis* and *trans* isomers.

Soil Dataset
Pfizer, Carolina Facility, Puerto Rico

Sample Number	Sample Depth/ Interval	Sample Date	Chloroform	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride	Petroleum Range Organics
TB-2	15	9/22/2010		0.0028 U	0.0032 U	0.0028 U	0.0034 U	0.0030 U	28.6
TB-3	4	9/22/2010		0.0027 U	0.0031 U	0.0027 U	0.0033 U	0.0030 U	4.9 U
TB-4	2	9/20/2010		0.0030 U	0.0034 U	0.0030 U	0.0037 U	0.0032 U	NA
TB-5	24	9/21/2010		0.0029 U	0.0033 U	0.0029 U	0.0036 U	0.0032 U	NA
TB-6	4	9/22/2010		0.0033 U	0.0037 U	0.0033 U	0.0041 U	0.0036 U	NA
TB-7	22	9/23/2010		0.0027 U	0.0031 U	0.0027 U	0.0033 U	0.0029 U	NA
TB-8	12	9/23/2010		0.0031 U	0.0035 U	0.0031 U	0.0038 U	0.0034 U	NA
TB-9	4	9/21/2010		0.0030 U	0.0034 U	0.0030 U	0.0037 U	0.0032 U	NA
TB-10	4	9/23/2010		0.0029 U	0.0033 U	0.0029U	0.0035 U	0.0031 U	25.0 U
TB-11	2	9/23/2010		0.0028 U	0.0031 U	0.0028 U	0.0034 U	0.0030 U	4.9 U
TB-12	5 - 6	9/23/2010		0.0032 U	0.0036 U	0.0032 U	0.0039 U	0.0035 U	5.5 U
TB-14	2 - 4	1/17/2011		0.0028 U	0.0031 U	0.0028 U	0.0034 U	0.0030 U	NA
TB-16	1 - 2	6/12/2013	0.0028 U	0.0024 U	0.0027 U	0.0024 U	0.0029 U	0.0026 U	NA
TB-18	2 - 3	6/13/2013	0.0033 U	0.0027 U	0.0918	0.0027 U	0.0034 U	0.0030 U	NA
TB-22	4 - 5	6/13/2013	0.0049 U	0.0041 U	0.0046 U	0.0041 U	0.0050 U	0.0044 U	NA
TB-33	3 - 5	7/16/2013	0.0041 U	0.0035 U	0.0039 U	0.0035 U	0.0043 U	0.0038 U	935
TB-41	20 - 22	7/17/2013	0.0037 U	0.0031 U	0.0222	0.0691	0.0038 U	0.0038 I	NA
TB-43	32 - 34	7/22/2013	0.0030 U	0.0025 U	0.575	0.555	0.0043 I	0.0454	NA
TB-48	24 - 26	7/24/2013	0.0031 U	0.0026 U	0.0032 I	0.0026 U	0.0032 U	0.0068	NA
TB-49	22 - 24	7/24/2013	0.0028 U	0.0024 U	0.0027 U	0.0034 I	0.0029 U	0.0026 U	NA
TB-50	22 - 24	7/24/2013	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.0025 U	0.0022 U	NA
TB-51	18 - 20	10/22/2013	0.0034 U	0.0029 U	0.0033 U	0.0029 U	0.0036 U	0.0031 U	NA
TB-52	20 - 22	10/23/2013	0.0035 U	0.0030 U	1.15	0.0311	0.0037 U	0.0032 U	NA
TB-52	22 - 24	10/23/2013	0.0045 I	0.0031 U	6.27	0.172	0.0038 U	0.0131	NA
TB-52	24 - 26	10/23/2013	0.0035	0.0029 U	1.63	0.0878	0.0036 U	0.0035 I	NA
TB-53	23	10/23/2013	0.0034 U	0.0029 U	0.0032 U	0.0029 U	0.0035 U	0.0031 U	NA
TB-53	24	10/23/2013	0.0032 U	0.0027 U	0.0031 U	0.0027 U	0.0033 U	0.0029 U	NA
TB-54	23	10/24/2013	0.0029 U	0.0053	0.005	0.007	0.0030 U	0.0062	NA
TB-59	23	10/29/2013	0.0046 U	0.0038 U	0.0043 U	0.0038 U	0.0047 U	0.0041 U	NA
TB-59-GW	35 - 40	10/29/2013		0.0116 U	0.0131 U	0.0116 U	0.0142 U	0.0125 U	NA
TB-61	24	12/8/2013		0.0013 U	0.0014 U	0.0013 U	0.0016 U	0.0014 U	NA
MW-13S-5	5	11/4/2013	0.0035 U	0.0029 U	0.0033 U	0.0029 U	0.0036 U	0.0032 U	NA
SB-65	20 - 22	11/7/2016		0.0022 U	0.279	0.145	0.0041 I	0.0024 U	NA
SB-65	24 - 26	11/7/2016		0.0027 U	0.0618	0.0063	0.0033 U	0.0029 U	NA
SB-65	32 - 34	11/9/2016		0.0035 U	0.0893	0.0132	0.0043 U	0.0038 U	NA
SB-67	18 - 20	11/9/2016		0.0026 U	0.0030 U	0.0078	0.0032 U	0.0028 U	NA
SB-68	14 - 16	11/9/2016		0.0027 U	0.0030 U	0.0027 U	0.0033 U	0.0029 U	NA
SB-69	20 - 22	4/26/2017		0.0030 U	0.0814	0.0030 U	0.0036 U	0.0032 U	NA
SB-70	12 - 14	4/26/2017		0.0036 U	0.875	0.00613	0.0044 U	0.0038 U	NA
SB-70	22 - 24	4/26/2017		0.0028 I	0.0029 U	0.0025 U	0.0031 U	0.0027 U	NA

Sample Number	Sample Depth/ Interval	Sample Date	Chloroform	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride	Petroleum Range Organics

Notes:
All analytical results reported as mg/kg (milligrams per kilogram)
U = Indicates the compound was analyzed for but not detected at a concentration greater than the shown MDL.
I = The reported value is between the laboratory MDL and the laboratory practical quantitation limit (PQL).
MDL = Method Detection Limit
NA - constituent not analyzed
Sample depth interval is in feet below ground surface.

ATTACHMENT B

DEPTH TO GROUNDWATER EVALUATION

WELL DESIGNATION	MW-01S	MW-02S	MW-03S	MW-04S	MW-05S	MW-06S	MW-07S
DATE	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)
2/2/2011	20.98	19.79	13.30	4.61	1.41	6.81	NI
10/17/2011	19.03	19.13	12.69	3.55	1.34	6.65	15.38
9/12/2012	20.41	19.99	13.21	3.85	1.39	6.58	16.14
4/17/2013	NM	20.84	14.45	NM	NM	NM	16.83
12/6/2013	NM	17.96	11.87	NM	0.40	5.62	14.15
2/3/2015	NM	19.75	13.23	NM	1.45	6.69	15.96
3/17/2015	NM	20.50	NM	NM	NM	NM	16.66
4/20/2015	NM	21.60	NM	NM	NM	NM	17.55
7/8/2015	NM	21.97	15.36	5.62	2.95	8.25	18.02
7/20/2016	21.63	20.34	13.91	3.10	1.28	7.17	16.60
6/19/2017	NM	20.23	NM	NM	NM	NM	16.45
Average	20.51	20.19	13.50	4.15	1.46	6.82	16.37
WELL DESIGNATION	MW-08S	MW-09S	MW-10S	MW-11S	MW-12S	MW-13S	MW-14S
DATE	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)
2/2/2011	NI	NI	NI	NI	NI	NI	NI
10/17/2011	16.38	4.70	NI	NI	NI	NI	NI
9/12/2012	16.86	4.99	NI	NI	NI	NI	NI
4/17/2013	NM	NM	NI	NI	NI	NI	NI
12/6/2013	15.52	3.97	17.04	18.33	9.93	20.93	16.85
2/3/2015	16.91	4.88	18.54	20.28	11.39	22.30	18.11
3/17/2015	NM	NM	NM	NM	NM	23.32	NM
4/20/2015	NM	NM	NM	NM	NM	23.00	NM
7/8/2015	19.10	6.43	20.75	22.62	13.74	24.71	21.24
7/20/2016	17.56	5.20	19.18	20.88	12.18	23.03	20.10
6/19/2017	NM	NM	NM	NM	NM	23.00	NM
Average	17.06	5.03	18.88	20.53	11.81	22.90	19.08
WELL DESIGNATION	MW-15S	MW-16S	MW-17S	MW-18S	MW-19S	MW-20S	MW-21S
DATE	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)
12/6/2013	16.45	NI	NI	NI	NI	NI	NI
2/3/2015	18.59	19.27	21.94	21.83	NI	NI	NI
3/17/2015	NM	20.23	23.03	22.79	NI	NI	NI
4/20/2015	NM	21.45	23.60	22.80	NI	NI	NI
7/8/2015	20.68	21.58	24.36	24.23	24.46	24.36	19.97
7/20/2016	19.17	19.88	24.65	23.12	22.81	22.69	18.47
6/19/2017	NM	22	22.00	22.20	NM	NM	18.45
Average	18.72	20.74	23.26	22.83	23.64	23.53	18.96
WELL DESIGNATION	MW-22S	MW-23S	MW-24S				
DATE	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)				
7/20/2016	18.78	18.72	23.68				
Average	18.78	18.72	23.68				
WELL DESIGNATION	MW-25S	MW-26S	MW-27S	MW-28S	MW-29S	MW-31S	
DATE	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	Depth to Water (ft)	
11/17/2016	18.17	NM	17.9	21.57	NM	NM	
6/20/2017	NM	20.2	NM	NM	19.55	15.03	
Average	18.17	20.2	17.9	21.57	19.55	15.03	

Notes:
ft - feet
NI - not indicated
NM - not measured

Depths to Groundwater
Pfizer, Carolina Facility, Puerto Rico

Group	Sample	Depth to Groundwater (ft)
1	MW-04S	4.1
	MW-05S	1.5
	MW-06S	6.8
	MW-09S	5.0
	Average	**4.4**
2	MW-07S	16
	MW-15S	19
	MW-21S	19
	MW-22S	19
	MW-31S	15
	Average	**18**
3	MW-02S	20
	MW-11S	21
	MW-16S	20
	MW-23S	19
	MW-24S	24
	MW-28S	22
	Average	**21**
4	MW-13S	23
	MW-17S	23
	MW-18S	23
	MW-19S	24
	MW-20S	24
	Average	**23**
5	MW-08S	17
	MW-10S	19
	MW-14S	19
	Average	**18**
6	MW-03S	14
	MW-12S	12
	Average	**13**
7	MW-01S	21
	Average	**21**
8	MW-25S	18
	MW-26S	20
	MW-27S	18
	MW-29S	20
	Average	**19**

ATTACHMENT C

JOHNSON & ETTINGER MODELS

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
127184		Tetrachloroethylene	1.04E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	556.96485	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC			SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
127184		Tetrachloroethylene	1.03E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	636.739265	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
127184		Tetrachloroethylene	1.06E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	688.7972	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.38	0.481	0.216

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
127184		Tetrachloroethylene	1.04E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	547.7256	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
127184		Tetrachloroethylene	1.06E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	385.7244	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC			SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
127184		Tetrachloroethylene	1.03E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	625.1448	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
127184		Tetrachloroethylene	1.04E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	549.7068	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
79016		Trichloroethylene	8.86E-06

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	133.0452	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

Group 2 TCE Johnson and Ettinger Evaluation

Pfizer, Carolina Facility, Puerto Rico

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
79016		Trichloroethylene	8.56E-06

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	556.96485	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC			SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
79016		Trichloroethylene	8.50E-06

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	636.739265	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC			SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
79016		Trichloroethylene	8.47E-06

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	688.7972	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
79016		Trichloroethylene	8.57E-06

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	547.7256	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
79016		Trichloroethylene	8.68E-06

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	385.7244	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC			SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
79016		Trichloroethylene	8.68E-06

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	625.1448	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR	SC	C	1.43	0.459	0.215

Enter either a vadose zone SCS soil type OR a user-defined permeability.

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
79016		Trichloroethylene	8.56E-06

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	549.7068	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC			SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
75014		Vinyl chloride (chloroethene)	1.61E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	556.96485	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
75014		Vinyl chloride (chloroethene)	1.60E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	636.739265	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
75014		Vinyl chloride (chloroethene)	1.59E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	688.7972	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
75014		Vinyl chloride (chloroethene)	1.61E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	547.7256	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
75014		Vinyl chloride (chloroethene)	1.64E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	385.7244	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES: X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES:

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical	Attenuation Factor
75014		Vinyl chloride (chloroethene)	1.61E-05

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	549.7068	SC	25	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
SC	OR		SC	1.63	0.385	0.197

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

Soil Properties Lookup Table

SCS Soil Type	K_s (cm/h)	α_1 (1/cm)	N (unitless)	M (unitless)	n (cm^3/cm^3)	θ_r (cm^3/cm^3)	Mean Grain Diameter (cm)	Bulk Density (g/cm^3)	θ_w (cm^3/cm^3)	SCS Soil Name
C	0.61	0.01496	1.253	0.2019	0.459	0.098	0.0092	1.43	0.215	Clay
CL	0.34	0.01581	1.416	0.2938	0.442	0.079	0.016	1.48	0.168	Clay Loam
L	0.50	0.01112	1.472	0.3207	0.399	0.061	0.020	1.59	0.148	Loam
LS	4.38	0.03475	1.746	0.4273	0.390	0.049	0.040	1.62	0.076	Loamy Sand
S	26.78	0.03524	3.177	0.6852	0.375	0.053	0.044	1.66	0.054	Sand
SC	0.47	0.03342	1.208	0.1722	0.385	0.117	0.025	1.63	0.197	Sandy Clay
SCL	0.55	0.02109	1.330	0.2481	0.384	0.063	0.029	1.63	0.146	Sandy Clay Loam
SI	1.82	0.00658	1.679	0.4044	0.489	0.050	0.0046	1.35	0.167	Silt
SIC	0.40	0.01622	1.321	0.2430	0.481	0.111	0.0039	1.38	0.216	Silty Clay
SICL	0.46	0.00839	1.521	0.3425	0.482	0.090	0.0056	1.37	0.198	Silty Clay Loam
SIL	0.76	0.00506	1.663	0.3987	0.439	0.065	0.011	1.49	0.180	Silt Loam
SL	1.60	0.02667	1.449	0.3099	0.387	0.039	0.030	1.62	0.103	Sandy Loam

Chemical Properties Lookup Table

CAS No.	Chemical	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Pure component water solubility, S (mg/L)	Henry's law constant H' (unitless)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	URF extrapolated (X)	RfC extrapolated (X)
75014	Vinyl chloride (chloroethene)	2.20E+01	1.10E-01	1.20E-05	8.80E+03	1.10E+00	2.80E-02	25	259.25	432.00	5,250	8.8E-06	1.0E-01		
79016	Trichloroethylene	6.10E+01	6.90E-02	1.00E-05	1.30E+03	4.00E-01	9.90E-02	25	360.36	544.20	7,505	1.1E-04	4.0E-02	X	
127184	Tetrachloroethylene	9.50E+01	5.00E-02	9.50E-06	2.10E+02	7.20E-01	1.80E-02	25	394.40	620.20	8,288	5.9E-06	6.0E-01		